

REMARKS

The Office Action dated May 30, 2003, has been received and reviewed.

Claims 1-13 are currently pending and under consideration in the above-referenced application. Each of claims 1-13 stands rejected.

Reconsideration of the above-referenced application is respectfully requested.

Claim Amendment

The amendment to independent claim 1, which includes replacement of “device region” with the term “surface,” was made merely to correct an inaccuracy with respect to terminology used to describe the surface on which the at least one conductive line is disposed. Independent claim 1 was not amended in response to any rejection or objection that has been set forth by the Office. It is, therefore, respectfully submitted that the amendment to claim 1 does not narrow the scope of independent claim 1. To the contrary, as an “active surface” is broader than and includes one or more “active device regions,” the amendment to independent claim 1 actually broadens the scope thereof.

Rejections Under 35 U.S.C. § 102(e)

Claims 1-13 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 6,110,831 to Cargo, et al. (hereinafter “Cargo”).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Cargo describes a semiconductor device which includes a substrate 51 with an active surface and at least one conductive line (gate 55) formed on the active surface of the substrate 51. *See* FIG. 2; col. 2, lines 30-37. A dielectric 61, which is formed over the active surface of

substrate 51 and gate 55, may include a lower portion which comprises undoped silicon dioxide and an upper portion which comprises doped silicon dioxide. *See* FIG. 2; col. 2, lines 38-45.

Windows 66 and 67 are formed through dielectric 61 so as to expose a source/drain region 57 of the substrate 51. As shown in FIGs. 2, 4-6, and 8 of Cargo, each window 66, 67 includes side walls that extend in continuous and uninterrupted fashion through the entire thickness of dielectric 61, including both doped and undoped portions thereof.

Independent claim 1, as amended and presented herein, recites a semiconductor device that includes a semiconductor substrate and at least one conductive line disposed upon an active surface of the semiconductor substrate. An undoped silicon dioxide cap is disposed over and in contact with the at least one conductive line. A passivation layer is located over the undoped silicon dioxide cap. At least one contact aperture is formed through the passivation layer and includes at least one sidewall that extends substantially perpendicularly relative to the semiconductor substrate. At least a portion of the at least one side wall terminates at the undoped silicon dioxide cap.

It is respectfully submitted that Cargo does not include any express or inherent description of several of the elements recited in amended independent claim 1.

First, it is respectfully submitted that the windows 66 and 67 of the semiconductor device described in Cargo and shown in FIGs. 2, 4-6, and 8 thereof do not include sidewalls which extend "substantially perpendicular" relative to the substrate 51 thereof. To the contrary, FIGs. 2, 4-6, and 8 of Cargo depict the windows 66 and 67 as having curved sidewalls which are oriented at a variety of nonperpendicular angles relative to the substrate 51. Thus, it appears that the windows 66 and 67 have been formed by isotropic etching processes.

Moreover, Cargo lacks any specific description of the type of etch process (isotropic or anisotropic) that may be used to form the windows 66 and 67. *See* the limited discussion provided at col. 2, lines 50-52.

Second, it is respectfully submitted that the description of Cargo (*see* FIGs. 2, 4-6, and 8) is limited to a semiconductor device which includes windows 66 and 67 with sidewalls that extend continuously and in uninterrupted fashion through dielectric 61, including both the upper,

doped silicon dioxide portion thereof and the lower, undoped silicon dioxide portion thereof. Thus, Cargo does not expressly or inherently describe that any portion of any of the sidewalls of window 66 or 67 terminates at an undoped silicon dioxide section of dielectric 61. As such, Cargo neither expressly nor inherently describes “at least one contact aperture” with “at least one sidewall” that includes “at least a portion” which “terminat[es] at [an] undoped silicon dioxide cap.”

Therefore, Cargo does not describe subject matter which anticipates each and every element recited in amended independent claim 1. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 102(e), the subject matter recited in amended independent claim 1 is allowable over that described in Cargo.

Each of claims 2-5 is allowable, among other reasons, for depending from claim 1, which is allowable.

Independent claim 6 is drawn to a semiconductor device that includes a semiconductor substrate, at least one undoped silicon oxide structure, and at least one doped silicon oxide structure over the at least one undoped silicon oxide structure. The at least one doped silicon oxide structure has at least one sidewall which is oriented substantially perpendicular to a plane of the semiconductor substrate. At least a portion of the at least one sidewall of independent claim 6 terminates at the at least one undoped silicon oxide structure.

Again, the sidewalls of the windows 66 and 67 of the semiconductor device structure that is described in Cargo extend continuously and uninterruptedly through the entire thickness of the dielectric 61 thereof. As the sidewalls of windows 66 and 67 extend along edge surfaces of the of lower, undoped silicon dioxide section of dielectric 61 of the semiconductor device structure described in Cargo, no portion of any of the sidewalls of window 66 or 67 terminates at an the lower, undoped silicon dioxide section of dielectric 61.

Moreover, FIGs. 2, 4-6, and 8 of Cargo clearly depict the sidewalls of windows 66 and 67 as being curved, presumed having been formed by isotropic etching processes, and oriented at a variety of nonperpendicular angles relative to the underlying semiconductor substrate. Further,

Cargo lacks any express or inherent description that window 66 or 67 may be formed by isotropic etch processes, which would result in sidewalls that are oriented substantially perpendicularly relative to a plane of the underlying substrate 51. Thus, Cargo neither expressly nor inherently describes that a sidewall of window 66 or 67 may be oriented substantially perpendicular to a plane of the substrate 51.

In view of these differences between the subject matter recited in independent claim 6 and that described in Cargo, it is respectfully submitted that Cargo does not anticipate each and every element of independent claim 6.

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(e), independent claim 6 recites subject matter which is allowable over that described in Cargo.

Claims 7-13 are each allowable, among other reasons, for depending either directly or indirectly from claim 6, which is allowable.

For these reasons, withdrawal of the 35 U.S.C. § 102(e) rejections of claims 1-13 is respectfully solicited.

CONCLUSION

It is respectfully submitted that each of claims 1-13 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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